

THE GENUS *CORYTHUCHA* STAL

(TINGIDAE; HETEROPTERA)

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Preluding the subject matter of this paper should come an introduction in the form of a tribute to the memory of the late Mr. Otto Heidemann, but, with an insufficient command of eloquence and composition, the author feels restrained from attempting to add more to the several eulogies which have appeared in entomological journals since Mr. Heidemann's death. It was the cherished hope and plan of Mr. Heidemann to revise the family Tingidae, and, with a wealth of material at hand and available for study, he no doubt would have accomplished his purpose in an admirable way, but even as he began he was called to a better land.

In this paper the author has made full use of the notes Mr. Heidemann left and throughout credit is given to him. The author is also extremely appreciative of much valuable advice from Messrs. Howard M. Parshley and Carl J. Drake, and for the generous loan of their collections, as well as those of Messrs. H. G. Barber, J. R. de la Torre Bueno, W. L. McAtee and Edgar L. Dickerson.

With the present paper the total number of described species of *Corythucha* has been brought to fifty-seven. At the time of Van Duzee's check-list, April 24, 1916, there were but fifteen known species. All but one of the fifty-seven species are known to occur in North America, including Mexico; six of them in Central America; two in the West Indies, and two in South America.

Members of the genus are all leaf feeders, but much is yet to be known regarding their host plants. It is quite likely that most of the species have restricted food preferences.

Stål described the genus *Corythucha* in 1873, erecting it upon his *fuscigera*, which is the logotype of the genus.

In regard to separating the species Mr. Heidemann often expressed his belief that the following characters or points should

be given the most weight: position and shape of hood and the height of its crest, the size of its areoles, the constriction on the hood, and also the relative height and length of the median carina. Besides these he recognized the following: size and form of the cells of the elytra, the armature, the rostral groove, the length of the antennae and rostrum. He at one time stated that the male characters were of no use in *Corythucha* and that he could find but little difference in the claspers. In a number of descriptions of new forms which have been recently published, considerable stress has been laid upon the comparative length of the first and second antennal joints. The author can not see the justification of the use of such characters in separating the species, as they are "hair-splitting," and as it has been frequently noted the comparative lengths of the first and second joints will vary considerably with the antennae of the same specimen. General size and intensity of color will also vary to a greater or lesser degree within the species.

The comparative measurements of the pronotal hood and median and lateral carinae are found to be very reliable and stable and, with the relative size of the areoles of hood and paranota and color pattern of elytra, form quite sufficient characters for specific diagnosis. In the key to the species and in their descriptions a sharp difference is made in the phrases, "hood . . . as high as median carina" and "height of hood." The latter applies to the measurement of the hood alone, taken by a line perpendicular to the line of the base of the hood and extending to its crest, while the former is a measurement of the distance from the top of the median carina to the line of the crest of the hood extended and parallel to the line of the body.

In establishing a key to the species, specimens of every species, and with the majority of species the types, have been examined, the key resulting from a direct study of the specimens rather than relying to any extent upon descriptions which in several instances are meager. A redescription of nearly every species has been necessary.

The species are here listed in what appears to be the logical natural order, which is based upon the color pattern of the elytra and general development of the pronotal hood. They may be considered as grouped into five distinct classes, typical of which

are *fuscigera* Stål, *cydoniae* Fitch, *morrilli* Osborn and Drake, *pallida* Osborn and Drake and *immaculata* Osborn and Drake.

Attention is called to the fact that credit should be given to Mr. H. M. Parshley for the species *C. borealis*, *pallipes* and *crypta* herein described as new species, and to Mr. C. J. Drake for *C. elegans*, *betulae*, *occidentalis*, *exigua*, *lactea* and *heidemanni*.

FOOD PLANT INDEX

The following list of food plants is given merely as an aid to identification. It is as complete as possible with the data at hand, which was taken from various publications and insect labels:

- Alder, common black (*Alnus rugosa*)
 - pergandei* Heidemann
- Apple (*Pyrus malus*)
 - caelata* Uhler
 - drakei* Gibson
 - mali* Gibson
- Birch, common sweet (*Betula lenta*)
 - pergandei* Heidemann
- Birch, yellow (*Betula lutea*)
 - betulae* Drake
- Bladder Nut, American (*Stathylea trifolia*)
 - bulbosa* Osborn and Drake
- Buckeye (*Aesculus glabrus*)
 - aesculi* Osborn and Drake
- Butternut (*Juglans cinerea*)
 - juglandis* Fitch
- Buttonbush (*Cephalanthus* species)
 - floridana* Heidemann
- Cherry, Wild (*Prunus serotina*)
 - associata* Osborn and Drake
 - pruni* Osborn and Drake
 - spinulosa* Gibson
- Cherry, Wild (*Prunus demissa*)
 - padi* Drake
- Chrysanthemums
 - marmorata* Uhler
- Crab Apple (*Pyrus prunifolia*)
 - pergandei* Heidemann
- Currant (*Ribes* species)
 - salicis* Osborn and Drake
- Elm (*Ulmus* species)
 - pergandei* Heidemann
 - ulmi* Osborn and Drake

- Eriodictyon californicum*
eriodictyonae Osborn and Drake
- Hackberry (*Celtis* species)
celtidis Osborn and Drake
- Hawthorn (*Crataegus* species)
cydoniae Fitch
brunnea Gibson
- Hazelnut (*Corylus americana*)
coryli Osborn and Drake
pergandei Heidemann
- Heteromeles arbutifolia*
incurrata Uhler
- Horse Chestnut (*Aesculus hippocastanum*)
aesculi Osborn and Drake
- Ichthyonethia piscipula*
gossypii Fabricius
- Juneberry (*Amelanchier intermedia*)
parshleyi Gibson
cydoniae Fitch
- Linden (*Tilia americana*)
juglandis Fitch
pallida Osborn and Drake
- Mulberry (*Morus rubra*)
pallida Osborn and Drake
- Oak (*Quercus* species)
Arcuata Say
floridana Heidemann
piercei Gibson
bellula Gibson
- Peach (*Prunus persica*)
associata Osborn and Drake
- Pecan (*Carya olivaeformis*)
parshleyi Gibson
- Poison Oak (*Rhus toxicodendron*)
coloradensis Gibson
- Quince (*Cydonia vulgaris*)
cydoniae Fitch
- Red Root (*Cranothus cardulatus*)
contaminata Gibson
obliqua Osborn and Drake
- Sunflower, Prairie (*Balsamorhiza sagittata*)
pura Gibson
- Sycamore (*Platanus* species)
ciliata Say
confraterna Gibson
- Thistle, Common or bull (*Carduus lanceolatus*)
distincta Osborn and Drake

- Thistle (*Cirsium* species)
distincta Osborn and Drake
 Vetchling (*Lathyrus* species)
distincta Osborn and Drake
 Walnut (*Juglans* species)
juglandis Fitch
parshleyi Gibson
 Willow (*Salix sieboldiana*)
pallipes Parshley
 Willow (*Salix* species)
salicata Gibson
salicis Osborn and Drake
elegans Drake

DISTRIBUTIONAL GROUPINGS OF SPECIES

The grouping as listed below is also as an aid to the identification of species. The definite limits of distribution of only a few species are known, hence the following should be considered merely as a guide:

UNITED STATES (universally distributed in United States)—*cydoniae* Fitch, *marmorata* Uhler, *pergandei* Heidemann.

EASTERN (east of the Rocky Mountains)—*acsculi* Osborn and Drake, *arcuata* Say, *associata* Osborn and Drake, *bulbosa* Osborn and Drake, *celtidis* Osborn and Drake, *ciliata* Say, *contracta* Osborn and Drake, *coryli* Osborn and Drake, *juglandis* Fitch, *pallida* Osborn and Drake, *parshleyi* Gibson, *pruni* Osborn and Drake, *spinulosa* Gibson, *ulmi* Osborn and Drake, *mali* Gibson, *elegans* Drake, *heidemannii* Drake, *betulae* Drake, *bellula* Gibson.

WESTERN (Rocky Mountains and West)—*caelata* Uhler, *coloradensis* Gibson, *confraterna* Gibson, *contaminata* Gibson, *distincta* Osborn and Drake, *drakei* Gibson, *elegans* Drake, *criodictyonae* Osborn and Drake, *hoodiana* Osborn and Drake, *immaculata* Osborn and Drake, *incurvata* Uhler, *morrilli* Osborn and Drake, *obliqua* Osborn and Drake, *padi* Drake, *pura* Gibson, *salicata* Gibson, *piccei* Gibson, *lactea* Drake, *occidentalis* Drake.

NORTHERN —*molliculata* Osborn and Drake, *salicis* Osborn and Drake.

NORTHEASTERN (New England States)—*borealis* Parshley, *cyrta* Parshley, *pallipes* Parshley.

SOUTHEASTERN—*floridana* Heidemann, *salicis* Osborn and Drake.

SOUTHERN (Southern United States, Mexico, Central America and South America)—*brunnea* Gibson, *decens* Stål, *fuscigera* Stål, *gossypii* Fabricius, *hispidula* Uhler, *mexicana* Gibson, *setosa* Champion, *spinosa* Dugès, *unifasciata* Champion, *fuscomaculata* Stål, *exigua* Drake.

CORYTHUCHA Stål

1873. *Corythucha* Stål, Enum. Hem., iii, p. 119.

Pronotal hood entirely concealing the head, with apex reaching a little in front of the head. Rostral sulcus uninterrupted by a transverse carina. Antennae rather long and slender and beset with bristly hairs; first segment at least twice the length of the second; second segment very short; third segment considerably longer than the first two taken together; fourth segment shorter than third, and more or less swollen. Paranota broad, armed on the outer margins with spines. Elytra narrowed at the base with outer margin strongly reflexed anteriorly, with a tumid elevation near the antero-inner margin. The nervures of hood, paranota, and the elytra irregularly armed with a few erect spines.

*Key to the Species*¹

1. Crest of pronotal hood at least twice as high as median carina.....2.
 Crest of pronotal hood not twice as high as median carina.....22.
2. Costal margins of elytra entirely embrowned.
 bulbosa Osborn and Drake (1)
 Costal margins of elytra not entirely embrowned.....3.
3. Length of median carina one-fourth the length of hood, lateral carinae almost obsolete.....**decens** Stål (39)
 Length of median carina distinctly more than one-fourth the length of hood, lateral carinae more or less prominent.....4.
4. Costal margins of elytra distinctly concave.....5.
 Costal margins of elytra nearly straight.....9.
5. Apical portion of elytra crossed by two brown bands.....6.
 Apical portion of elytra crossed by a single band.....7.
6. Species small, narrow.....*morrilli* Osborn and Drake (38)
 Species large, broad.....*lactea* Drake, new species (35)
7. Apical band wide, solid brown.....8.
 Apical band narrow, more or less indistinct.....*incurvata* Uhler (32)
8. Paranota with large brown spot.....*occidentalis* Drake, new species (28)
 Paranota without spot.....*coryli* Osborn and Drake (30)
9. Length of hood noticeably greater than length of median carina.....10.
 Length of hood not greater than length of median carina.....20.
10. Height of hood distinctly greater than length of median carina.
 associata Osborn and Drake (4)
 Height of hood not distinctly greater than length of median carina.....11.

¹The number, in parenthesis, occurring after the specific name indicates the order in which its description occurs in the list of species.

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| 11. Species small, less than 3.5 mm. long..... | 12. |
| Species large, more than 3.5 mm. long..... | 14. |
| 12. Crest of hood rounding,..... | <i>borealis</i> Parshley, new species (31) |
| Crest of hood angulate..... | 13. |
| 13. Two or three apical areoles of elytra entirely hyaline. | |
| | <i>bellula</i> new species (34) |
| None of apical areoles entirely hyaline..... | <i>brunnea</i> new species (33) |
| 14. Three large areoles in apical band of elytra entirely hyaline..... | 15. |
| Three smaller areoles in apical band of elytra not entirely hyaline, partly opaque..... | 16. |
| 15. Crest of hood acute or angulate, top from crest forward straight. | |
| | <i>spinulosa</i> new species (5) |
| Crest of hood rounding and top from crest forward convex, not straight. | |
| | <i>cyrta</i> Parshley, new species (18) |
| 16. Areoles of paranota opaque, creamy; brown markings light. | |
| | <i>elegans</i> Drake, new species (25) |
| Areoles of paranota hyaline; brown markings dark..... | 17. |
| 17. Species large, 4 mm. long..... | 18. |
| Species smaller, less than 4 mm. long..... | 19. |
| 18. Apical band of elytra very wide, one-third the length of elytra. | |
| | <i>betulae</i> Drake, new species (19) |
| Apical band of elytra narrow, not more than one fourth the length of elytra..... | <i>padi</i> Drake (22) |
| 19. Paranotal spot large, posterior margin of apical band of elytra straight. | |
| | <i>cydoniae</i> Fitch (21) |
| Paranotal spot small, posterior margin of apical band of elytra rounding. | |
| | <i>heidemanni</i> Drake, new species (20) |
| 20. Reticulations of hood more than twice the size of those of paranota. | |
| | <i>juglandis</i> Fitch (7) |
| Reticulations of hood not more than twice the size of those of paranota..... | 21. |
| 21. Hood comparatively high, lateral carinae terminating near to base of hood. | |
| | <i>distincta</i> Osborn and Drake (8) |
| Hood comparatively low, lateral carinae terminating far from base of hood. | |
| | <i>pergandeii</i> Heidemann (29) |
| 22. Reticulations of globose portion of hood greater than those of the paranota..... | 23. |
| Reticulations of globose portion of hood about the same size as those of paranota..... | 48. |
| 23. Height of hood less than one-half of its own length..... | 24. |
| Height of hood one-half or more of its own length..... | 29. |
| 24. Only color markings on membranous portions are on tumid elevations of elytra..... | <i>ciliata</i> Say (52) |
| More extensive color markings..... | 25. |
| 25. A distinct brown band across apex of elytra..... | 27. |
| No distinct brown band across apex of elytra, only a trace of one..... | 26. |
| 26. A distinct brown band across base of elytra..... | <i>arcuata</i> Say (51) |
| No distinct brown band across base of elytra..... | <i>confraterna</i> new species (53) |

27. Hood longer than median carina.....28.
 Hood shorter than median carina.....*obliqua* Osborn and Drake (14)
28. Apical band of elytra wide, one-third the length of elytra, species large.
 *pruni* Osborn and Drake (6)
 Apical band of elytra narrow, not more than one-fourth the length of
 elytra, species small.....*exigua* Drake, new species (13)
29. Size small, 3 mm. long or less.....*floridana* Heidemann (49)
 Size larger, more than 3 mm. long.....30.
30. Length of hood noticeably shorter than median carina.....31.
 Length of hood not noticeably shorter than median carina.....33.
31. With a distinct dark brown band across base of elytra, and a less distinct
 one across apex.....32.
 No distinct dark brown bands or markings on elytra, sometimes a trace of
 light brown bands.....*immaculata* Osborn and Drake (54)
32. Spines on membranous margins long, globose portion of hood narrow.
 *unifasciata* Champion (41)
 Spines on membranous margins short, globose portion of hood wide.
 *contaminata* new species (10)
33. Length of hood noticeably longer than median carina.....34.
 Length of hood and median carina about equal.....40.
34. Width of apical band on elytra one-quarter or less than entire length of
 elytra.....35.
 Width of apical band on elytra nearly a third or more the length of elytra. 37.
35. The two or three large areoles in apical band entirely hyaline.....36.
 The two or three large areoles in apical band clouded, only partially
 hyaline.....*coloradensis* new species (24)
36. Two prominent brown spots on paranota.....*fuscumaculata* Stål (23)
 A single brown spot on paranota.....*parshleyi* new species (12)
37. Apical band of elytra nearly solid brown, excepting two or three hyaline
 areoles.....*aesculi* Osborn and Drake (3)
 Apical band not solid brown, many hyaline areoles.....38.
38. Distinct brown spot at center of costal margin.....39.
 No distinct brown spot at center of costal margin.....*fuscigera* Stål (2)
39. Lateral carinae terminating near to base of hood.
 *mexicana* new species (31)
 Lateral carinae terminating far from base of hood.....*marmorata* Uhler (36)
40. Distinct brown bands across elytra.....41.
 No distinct brown bands across elytra, nearly unicolorous.
 *pallida* Osborn and Drake (47)
41. Spines along membranous margins and on nervures of hood and elytra
 very small and comparatively few.....42.
 Spines of normal length and number.....44.
42. Species large, over 4 mm. long.....*hoodiana* Osborn and Drake (9)
 Species smaller, less than 4 mm. long.....43.
43. Hood abruptly constricted.....*salicis* Osborn and Drake (17)
 Hood constricted but not abruptly so.....*molliculata* Osborn and Drake (26)

44. Distinct brown band across apex of elytra46.
 Without distinct brown band across apex of elytra, nervures may be
 embrowned but areoles not clouded.45.
45. Brown spot on paranota large.*ulmi* Osborn and Drake (42)
 Brown spot on paranota small.*mali* new species (43)
46. Apical band solid brown except for two or three hyaline areoles.
pallipes Parshley, new species (11)
 Apical band not solid brown, very few areoles entirely clouded, many
 partially hyaline.47.
47. Paranotal spot large and prominent, hood considerably embrowned.
piercei new species (16)
 Paranotal spot small, not prominent, hood but slightly embrowned.
celtides Osborn and Drake (15)
48. Median carina extremely low, with never more than one row of small
 areoles.49.
 Median carina normal height, often two rows of areoles.52.
49. Pronotal hood constricted.50.
 Pronotal hood not constricted.*setosa* Champion (48)
50. Spines long and numerous on nervures of membranous portions.51.
 Spines not numerous on membranous portions.*caelata* Uhler (50)
51. Width of globose portion of hood less than maximum distance between
 lateral carinae.*spinosa* Dugès (45)
 Width of globose portion of hood as great or greater than maximum dis-
 tance between lateral carinae.*eriodictyonae* Osborn and Drake (46)
52. Median carina as high or higher than hood.*gossypii* Fabricius (40)
 Median carina lower than hood.53.
53. Lateral carinae terminating close against base of hood.*pura* Gibson (55)
 Lateral carinae terminating near to base of hood.54.
54. Spines on membranous margins and nervures numerous, large.
hispidula Uhler (56)
 Comparatively few spines on membranous margins and nervures, small. 55.
55. Tumid elevations of elytra well rounded, long.*drakei* new species (44)
 Tumid elevations of elytra rather pointed, acute, short.
salicata new species (27)

1. *Corythucha bulbosa* Osborn and Drake

1916. *Corythucha bulbosa* Osborn and Drake, Ohio Biol. Sur., ii, no. 4, p. 232.

Pronotal hood extremely large and high, more than twice as high as median carina; height equal to more than two-thirds the length of the hood. Hood considerably longer than median carina, not at all flattened on top or posteriorly; abruptly constricted at the middle; globose portion large with its width greater than its length. Reticulations of hood large. Median carina arched, with large areoles. Lateral carinae very small, short, and low without distinct areoles. Costal margins of elytra straight. Spines on membranous margins and nervures very small and dark. Size, 4.6 mm. long, 2.6 mm. wide.

General color dark. Antennae and legs yellowish. Hood embrowned, the center of a few large areoles hyaline. Paranota dark brown. Elytra dark brown, the centers of two large areoles near the apex and a few areoles on inner margins of costal area hyaline.

This is the largest of all the species and easily recognized by the brown costal margins of the elytra. Previous to its being described by Osborn and Drake it was known by the following manuscript names, *carbonata* of Uhler and Heidemann and *staphylea* of Heidemann. It is known to occur on *Staphylea trifolia*, American bladder nut, and its present known range is from Maryland and Virginia west to Ohio. Large series of specimens have been examined, besides the type and paratypes.

2. *Corythucha fuscigera* Stål

1862. *Tingis fuscigera* Stål, Stett. Ent. Zeit., p. 323.

1876. *Corythucha fuscigera* Stål, Enum. Hem., iii, p. 122.

1873. *Monanthia lucida* Walk., Cat. Hem. Het., vi, p. 191.

Pronotal hood higher but not twice as high as the median carina, its height is two-thirds the length of the hood. Length of hood greater than length of median carina. Hood abruptly constricted, the globose portion wider than long, not flattened on top or posteriorly. Reticulations of hood large. Median carina with large areoles. Lateral carinae of medium height, cloudy, and terminating a considerable distance from base of hood. Costal borders of elytra straight. Spines short, numerous on border of paranota. Length 4.5 mm., width 2.5 mm.

Membranous portions hyaline marked with brown. Nervures yellow. Hood more or less embrowned. Two brown spots on paranota. Tumid elevations of elytra with brown spot. Brown bands across base and apex of elytra. Two hyaline areoles in apical band.

The species ranges from New Jersey west to Colorado and Arizona and south through Mexico and Central America. Food plant unknown. Many series of specimens have been examined.

3. *Corythucha aesculi* Osborn and Drake

1916. * *Corythucha aesculi* Osborn & Drake, Ohio Biol. Sur., ii, no. 4, p. 232.

Pronotal hood somewhat higher than median carina but not twice as high; its height equal to one-half or more of its length and about equal to the length of median carina. Length of hood noticeably greater than length of median carina. Globose portion of hood large, wider than long, and with large areoles. Median carina high and well arched. Lateral carinae small. Costal margins of elytra straight. Spines on membranous borders medium length and numerous, scarce on nervures.

General color dark brown. Hood almost entirely embrowned. Brown band across base and apex of elytra; apical one wide, at least one-third the length of elytra and entirely brown excepting two or three large hyaline areoles.

Nervures yellow. Brown spot on paranota, sometimes appearing as two. Size, 4 mm. long, 2 mm. wide.

This species is second only in size to *bulbosa* Osborn and Drake. The very large hood and wide dense apical band across elytra are characteristic. Osborn and Drake note its occurrence in Ohio, Illinois and Kentucky on buckeye (*Aesculus glabrus*) and states that it hibernates in the adult stage. It is also reported to occur on horse chestnut (*Aesculus hippocastanum*). The type and twenty-two paratypes were examined.

4. ***Corythucha associata*** Osborn and Drake

1916. *Corythucha associata* Osborn and Drake, Ohio Journal Sci., xvii, no. 1, p. 14.

Hood very large, three times as high as median carina, and nearly as high as long; considerably longer than median carina. Height of hood noticeably greater than length of median carina. Reticulations of hood large. Sides of elytra straight. Spines on membranous margins and nervures moderately long and normally numerous. Size, 4.1 mm. long, 2.4 mm. wide.

Hood embrowned. Brown band across base and apex of elytra. Apical band as wide as one-third the length of elytra, with two or three large hyaline areoles.

Wild Cherry (*Prunus scrotina*) and peach are the known food plants of this species. Its occurrence is recorded from New York west and south through Tennessee and Georgia. Specimens studied included the type and fifteen paratypes.

5. ***Corythucha spinulosa*** new species

Hood twice as high as median carina and noticeably longer. Height of hood equals about two-thirds the length of hood, and not much greater than length of median carina. Median carina with two rows of areoles. Reticulations of hood large. Costal margins of elytra nearly straight. Spines on membranous margins normally long, not numerous on nervures. Size, 4 mm. long, 2.5 mm. wide.

Hood embrowned on top. Nervures of paranota yellow, with only a trace of brown spots. Dark brown band across base and apex of elytra. Apical band slightly less in width than one-third length of elytra. Two or three large hyaline areoles in apical band and several partial hyaline.

Differs from *associata* Osborn and Drake in having a lower hood, fewer spines on nervures, two rows of areoles in median carina, and a narrower apical band across elytra. Distinguished from *cyrtia* Parshley in having crest of hood more acute and angulate and top from crest forward nearly straight.

Type.—♀, Jamesburg, New Jersey. (H. B. Weiss, collector.) (Collection of H. M. Parshley.) *Allotype*.—♂, same data as type. *Paratypes*.—Two males, Jamesburg, New Jersey. (Collection of H. M. Parshley.) One female and two males, Jamesburg, New Jersey. (Collection of H. B. Wiess.)

Many other specimens from the same locality have been examined. The food plant of this species is Wild Cherry (*Prunus serotina*).

6. *Corythucha pruni* Osborne and Drake

1916. *Corythucha pruni* Osborn and Drake, Ohio Biol. Sur., ii, no. 4, p. 231.

Height of hood less than one-half its own length and but little higher than median carina. Hood longer than median carina. Median carina rather high with two rows of areoles. Reticulations of hood large. Spines on membranous margins and nervures rather short, not numerous. Size, 4.2 mm. long, 2.3 mm. wide.

Nervures yellow, those on hood more or less embrowned. Brown spot on paranota and brown band across base and apex of elytra. Width of apical band slightly less than one-third of elytra, with two or three large hyaline areoles.

The large, long, low hood is characteristic of this species.

Two paratypes in the Drake collection were examined. They were collected on Wild Cherry (*Prunus serotina*) at Washington, District of Columbia, by Prof. Hine. Captures have been recorded from New York south to North Carolina and west to Ohio. The manuscript name *cerasi* of Heidemann refers to this species.

7. *Corythucha juglandis* Fitch

1866. *Corythucha juglandis* Fitch, Third Rept. Ins. N. Y., p. 466.

This species presents the greatest difficulties in its identification, and specimens in nearly every collection examined have been wrongly determined as *juglandis*. There are two quite distinct species which infest the walnut, one of which, *parshleyi*, is here described as new. The fact that these two species occur in the type series in the Fitch collection is probably responsible for the more or less vague conception of *juglandis*. This is the only species in the genus which exhibits any marked variance in the height of the hood as compared to the height of median carina. By far the great majority of specimens examined, the type included, have the hood at least twice as high as the median carina, a few have the hood but slightly higher than the carina, in this respect resembling *parshleyi*. However, *juglandis* is somewhat

smaller than *parshleyi* and has the apical band straight across the elytra, while in *parshleyi* the apical band runs obliquely from the costal margin toward the inner margin of elytra and is narrower.

Pronotal hood at least twice as high as median carina with its height fully two-thirds its own width. Length of hood not noticeably longer than median carina, sometimes slightly so. Reticulations of hood very large, more than twice the size of those of the paranota. Spines normal, rather short. Costal margin of elytra nearly straight. Size 3.3 mm. to 3.8 mm. long, 2 to 2.3 mm. wide.

General aspect above yellow or light brown. A light spot on paranota, sometimes a faint second one. Brown band across base of elytra and another across elytra near apex. Anterior border of apical band straight, not slanting from inner margin of elytra to costal margin.

The type, a male without locality data, in the U. S. National Museum, and a fine series in the Parshley collection have been examined. The species occurs throughout New England and south and west to Kansas and Texas. Its food plants include walnut, butternut, and linden.

8. *Corythucha distincta* Osborn and Drake

1916. *Corythucha distincta* Osborn and Drake, Ohio Journ. Sci., xxvii, p. 13.

1917. *Corythucha distincta* var. *spinata* Osborn and Drake, Ohio Journ. Sci., xxvii, no. 8, p. 301.

Hood at least twice as high as median carina. Length of hood slightly, if any, less than length of carina. Height of hood equals one-half or more its own length. Median carina long, not prominently arched, and with two rows of areoles. Spines on membranous margins and nervures of moderate length. Reticulations of hood not more than twice the size of those on paranota. Lateral carinae large with distinct areoles, and terminating near base of hood.

Hood embrowned. Two prominent brown spots on paranota the hind one being the largest. Distinct brown bands across base and apex of elytra. Apical band with two or three hyaline areoles. A small brown spot at center of costal margin of elytra. Size, 4 mm. long, 2.41 mm. wide.

A paratype and fifteen specimens in the Drake collection have been examined. Type and paratype specimens are from Colorado. Messrs. Osborn and Drake state that specimens were taken on *Carduus lanceolatus* by A. O. Larson in Utah. The range of the species is known to include Washington, Montana, Wyoming, Colorado, Utah and California. The variety *spinata* of the same authors I cannot give varietal rank, as the type specimen differs only in being slightly larger and darker. The specimens in the Drake collection determined as *distincta* var. *spinata*

are comparatively fresh specimens, while those from which the specific description was made are ten years older, hence a fading in color markings, and in these older specimens many of the spines seem to have been rubbed off. Osborn and Drake record their var. *spinata* from "thistle."

9. **Corythucha hoodiana** Osborn and Drake

1917. *Corythucha hoodiana* Osborn and Drake, Ohio Jr. Sci., xvii, no. 8, p. 302.

Height of hood equals one-half its length, and its length about equal to length of median carina. Median carina large, with two rows of areoles and about as high as hood. Lateral carinae rather large with distinct areoles. Reticulations of hood large. Spines on membranous margins and nervures small and scarce. Size, 4.3 mm. long, 2.6 mm. wide.

Nervures yellow. Light brown spot on paranota. Brown band at base and apex of elytra. Apical band with three large hyaline areoles and width about one-quarter the length of elytra.

The species was described from a single specimen taken on Mt. Hood, Oregon. Food plant unknown. Type examined.

10. **Corythucha contaminata** new species

Pronotal hood slightly higher and shorter than median carina, its height is at least one-half its own length. Lateral carinae long with distinct areoles. Reticulations of hood not over twice the size of those of the membranous pronotal margins. Spines on membranous margins small. Size, 3.5 mm. long, 2.3 mm. wide. Nervures of hood embrowned.

Two brown spots on paranota. Brown bands at base and apex of elytra, apical band narrow with several hyaline areoles. Tumid elevations embrowned and a small brown spot at center of costal margin of elytra.

Type.—♀, Moscow, Idaho. *Allotype*.—♂, Moscow, Idaho. *Paratypes*.—Three males, Moscow, Idaho. (Collection of U. S. Nat. Museum.)

Other specimens are at hand from Oregon and California, from *Ceanothus cardulatus*. *Contaminata* is a Uhler manuscript name. Osborn and Drake place it synonymous with *distincta*. The author, however, after examining specimens labelled in Uhler's own handwriting, and from his collection, concludes that this is a distinct species. It may be easily separated from *distincta* Osborn and Drake by the comparatively low hood and shorter lateral carinae.

11. **Corythucha pallipes** Parshley, new species

Hood higher but not twice as high as median carina, its height equals to one-half or more of its own length. Length of hood and median carina about equal. Reticulations of hood large. Spines on membranous margins long,

scarce on nervures. Lateral carinae with distinct areoles. Size, 3.5 mm. long, 2.2 mm. wide.

Hood more or less embrowned. A more or less distinct brown spot on paranota. Distinct dark brown bands across base and apex of elytra. Apical band with two or three large hyaline areoles. Width of apical band about one-fourth of elytra.

Type.—♀, Stamford, Connecticut. *Allotype*.—♂, Stamford, Connecticut. *Paratypes*.—Five females and one male, Stamford, Connecticut. (Collection of H. M. Parshley.)

The above specimens were captured from *Salix sieboldiana*, an imported species.

12. *Corythucha parshleyi* new species

Pronotal hood slightly higher and noticeably longer than median carina, its height about equal to one-half its own length. Median carina well arched. Lateral carinae short but normally high. Reticulations of hood large. Spines on membranous margins normal length, numerous on nervures on anterior portion of hood. Size, 4 mm. long, 2.3 mm. wide.

Crest of hood embrowned. Only a very faint trace of a brown spot on paranota. Dark brown bands across base and apex of elytra and on posterior portion of tumid elevation. Apical band slightly less in width than one-fourth length of elytra and with three large areoles entirely hyaline. Apical band running up along inner border of elytra.

Type.—♀, Hammonton, New Jersey. (H. B. Weiss.) (Collection of H. M. Parshley.) *Allotype*.—♂, same data as type. *Paratypes*.—Seven females and seven males, same data as type.

The above specimens were captured from *Amelanchier intermedia*. One specimen in the Parshley collection is labelled as occurring on walnut.

Named in honor of Mr. Howard M. Parshley, who has taken a very active interest in this genus.

Mr. Drake sent me a single specimen, which appears to be this species, which he states was collected by Prof. R. W. Leiby from pecan at Lake Waccamaw, North Carolina, September, 1915.

13. *Corythucha exigua* Drake, new species

Hood moderately elevated, three times as long as high, moderately constricted back of the middle. Pronotum with the lateral margins very long, moderately broad, armed on the outer margin with numerous spines; median carina rather highly elevated, not quite as high as the hood, with a double

series of cells near the middle; lateral carinae widely separated from the hood, raised anteriorly and with two or three distinct cells. Antennae clothed with a few long hairs. Elytra with the outer margin nearly straight and armed with numerous spines, the costal area with three to four rows of areoles. Length male and female 3.4 mm.; width 2.2 mm.

Color. General color whitish, marked with fuscous. Pronotum brown; paranota, hood and carinae with areolae hyaline; a few of the nervures on the dorsal part of the hood and a small spot on the paranota fuscous. Elytra hyaline, a band near the base, another near the tip (a rather large hyaline spot near the middle), posterior portion of tumid elevation and more or less of sutural area fuscous. Antennae and legs testaceous, the apices brownish. Body beneath brownish and partially blackened.

Type.—♀, Collected near Lake Waccamaw, North Carolina, June 9, 1915, by Prof. R. W. Leiby. (Collection of C. J. Drake.)

Paratype.—♀, same data as type. (Collection of Department of Agriculture of North Carolina, at Raleigh.)

14. **Corythucha obliqua** Osborn and Drake

1916. *Corythucha obliqua* Osborn and Drake, Ohio Jr. Sci., xvii, no. 1, p. 11, Nov., 1916.

Hood slightly higher and noticeably shorter than median carina. Height of hood slightly less than one-half its own length. Lateral carinae rather long. Reticulations of hood not more than twice the size of those of the paranota. Costal margins of elytra straight. Spines on membranous margins rather short, numerous on nervures of hood. Size, 3.45 mm. long, 1.44 mm. wide.

Hood dark brown. Two dark brown spots on paranota. Brown bands across base and near apex of elytra. Apical band appearing very narrow and slanting anteriorly from costal margin.

The type, from Dutch Flats, Placer County, California, and six other specimens from Oregon, in the Drake collection, have been examined. The species also occurs in Idaho. Food plant is *Ceanothus* species.

15. **Corythucha celtidis** Osborn and Drake

1916. *Corythucha celtidis* Osborn and Drake, Ohio Biol. Soc., ii, no. 4, p. 227.

Pronotal hood slightly higher than and about equal in length to median carina. Height of hood one-half its own length. Median carina not prominently arched. Lateral carinae short. Reticulations of hood large. Spines along membranous margins of normal length and number. Costal margins of elytra straight. Size, 3.6 mm. long, 1.8 mm. wide.

Few nervures on top of hood sometimes embrowned. A small brown spot on paranota, sometimes a trace of a second spot. Dark brown bands across base and apex of elytra. Apical band not solid brown, very few areoles entirely clouded, many partially hyaline.

Five paratypes from Columbus, Ohio, in the Drake collection, and numerous other specimens from Ohio have been examined. Hackberry is given by Osborn and Drake as the food plant of this species.

16. **Corythucha piercei** new species

Very similar to *celtidis* Osborn and Drake, but differing from it in having the brown spot on the paranota distinctly larger and darker and the hood more extensively embrowned. The median carina in *piercei* is also slightly more arched.

Pronotal hood slightly higher than median carina, with its height at least one-half its own length. Hood and median carina equal in length. Reticulations of hood slightly more than twice the size of those of the paranota. Lateral carinae of medium height and short. Spines on membranous margins and nervures numerous and moderately long. Costal margins of elytra nearly straight. Membranous portions hyaline, nervures slightly yellowish. Hood more or less heavily embrowned on top. A large brown spot on anterior portion of paranota. Elytra with distinct basal and apical bands. Apical band not entirely brown, with many partially hyaline areoles. Size, 3.7 mm. long, 2 mm. wide.

Type.—♀, Williams, Arizona. (Dr. W. D. Pierce.) (Collection of United States National Museum.) *Allotype*.—♂, same data as type. *Paratypes*.—One female and three males, same data as type.

The species is named in honor of Dr. W. D. Pierce, who collected all stages of the species from *Quercus* species, during August, 1917.

17. **Corythucha salicis** Osborn and Drake

1917. *Corythucha salicis* Osborn and Drake, Ohio Jr. Sci., xvii, no. 8, p. 298.

Pronotal hood high, but not twice as high as median carina and distinctly longer than median carina. Height of hood at least one-half its own length. Median carina rather low, not arched. Lateral carina short. Spines on membranous margins. Reticulations of hood larger than those of paranota. Size, 3.5 mm. long, 1.9 mm. wide.

Membranous portions whitish-hyaline marked with dark brown. Hood more or less embrowned. A rather faint spot on paranota. Elytra with brown bands across base and apex. Apical band only on costal half.

Separable from *molliculata* in its smaller size and hood a little more abruptly constricted. These two species may prove to be the same, but until more specimens can be provided and examined from the type locality of *molliculata*, and that species more definitely determined, it is well to keep them distinct.

The type specimen from Middlesex Falls, Massachusetts, in the Drake Collection, has been examined and also other specimens from Wisconsin and Montana. A report of its occurrence in Florida has also come to hand. It is known to occur on willow and currant.

18. **Corythucha cyrta** Parshley, new species

Very similar to *spinulosa* Gibson, but differing from it in having a more rounded crest of hood with the top line from crest forward convex and rounded, and in having color markings of a lighter brown.

Hood twice as high as median carina but height of hood not noticeably greater than length of carina. Height of hood two-thirds its length, which is noticeably greater than length of carina. Reticulations of hood large. Spines on membranous margins and nervures rather short. Costal margin of elytra straight. Size, 3.7 mm. to 3.9 mm. long, 2.2 mm. wide. Hood more or less embrowned. A brown spot on paranota. Brown band across base and apex of elytra. Three medium sized hyaline areoles grouped together in apical band, forming a large circle.

The food plant is unknown but it has been taken from sphagnum. Records are from Maine and Massachusetts.

Type.—♀, Liberty, Maine. (Collection of H. M. Parshley.)

Allotype.—♂, same data as type. *Paratypes*.—Two females, same data as type.

Other specimens examined are from Fort Kent and Orono, Maine, Beach Bluff and Chester, Massachusetts, and Bretton Woods, New Hampshire.

19. **Corythucha betulae** Drake, new species

Hood large, highly elevated, the length one and one-fourth times the height, abruptly constricted near the middle, the anterior portion narrow and the posterior portion large and nearly globose. Pronotum with the lateral margins rather large, reniform, the outer margins armed with spines; median carina moderately elevated, slightly more than one-third of the height of the hood; lateral carinae raised anteriorly, with three or four distinct cells, widely separated from the hood. Antennae clothed with a few long hairs, the first segment slightly more than twice the length of the second. Elytra with the outer margin nearly straight and armed with spines (except distal third), the costal area with three or four rows of areoles. Wings a little longer than the abdomen. Length 4.3 mm., width 2.65 mm.

Color. Body beneath black, the claspers in the male brownish. Antennae and legs testaceous, the tips of each brownish. Pronotum brownish; paranota with areolae hyaline and the nervures testaceous, except a few nervelets near the middle fuscous. Hood with a few of the nervures partially embrowned,

the areolae translucent. Elytra with a rather broad band near the base, another near the distal end (a few cells hyaline near the middle) brown or light fuscous.

Numerous specimens, taken at various times during the months of July, August and September on yellow birch (*Betula lutea*), by Mr. Drake, near Cranberry Lake, New York. He reports it as probably one of the most common northern tingids.

Type.—♀, Cranberry Lake, New York. (Collection of C. J. Drake.)

20. ***Corythucha heidemanni*** Drake, new species

Hood rather large, abruptly constricted near the middle, one and two-thirds times as long as high, armed with a few spines on the sides, subglobose, the posterior portion large and rather broad. Pronotum with the lateral margins rather broad and long, the margins armed with spines; median carina about one-third as high as the hood, the lateral carinae widely separated from the hood, raised anteriorly and with two or three distinct cells. Elytra with the outer margin nearly straight and armed with spines like most of the other members of the genus; costal area mostly triseriate, three or four extra cells near the base. Claspers strongly curved in the male. Antennae clothed with a few long hairs. Length 3.7 mm., width 2.45 mm.

Color. Abdomen beneath black, the rostral sulcus and bucculae brownish. Legs and antennae yellowish-brown, the tips of each darker. Pronotum dark brown; paranota with a few fuscous markings near the outer margin about the middle, the nervures testaceous and the areolae mostly hyaline. Elytra with a rather broad band near the base, another near the distal end, posterior portion of tumid elevation, and more or less of sutural area, fuscous.

Type.—♀, Cranberry Lake, New York. (Collection of C. J. Drake.) *Paratypes* in the collection of the United States National Museum, Ohio State University, and the California Academy of Science.

A common species in the Adirondacks, around Cranberry Lake, New York.

21. ***Corythucha cydoniae*** Fitch

1861. *Tingis cydoniae* Fitch, Country Gentleman, xvii, no. 7.

1879. *Corythucha arcuata* Comstock (not of Say), Rept. U. S. Dept. Agric., 1879.

1903. *Corythucha arcuata crataegi* Morrill, Psyche, x, p. 132.

1916. *Corythucha crataegi* Osborn and Drake, Ohio Biol. Sur., ii, no. 4, p. 229.

Crest of pronotal hood slightly more than twice as high as median carina, height slightly more than one-half the length of hood, length of hood greater than length of median carina, globose portion with width greater than the

length. Hood not flattened on top or posteriorly. Reticulations of hood large but not extremely so. Hood constricted, making the anterior portion of the hood appear long and narrow, not distinctly triangular. Median carina with areoles, sometimes two rows. Lateral carinae normally high, terminating a considerable distance from base of hood, with areoles. Costal margins of elytra slightly concave. Spines on margins of membranous portions and at apex of hood short. Nervures only spined at apex of hood. Length 3.5 mm., width 1.7 mm.

Antennae, legs, and nervures light yellow. Hood more or less embrowned. Paranota with a large brown spot. Elytra with a brown band at base and one near apex. Inner margin of elytra brown. Apex of elytra hyaline.

It is interesting to note that Prof. J. H. Comstock in the 1879 Report of the United States Department of Agriculture described the egg and immature form, which at that time Prof. P. R. Uhler considered merely a phytophagie form of *arcuata* Say. Later, in 1903, Dr. A. W. Morrill described the eggs under the name *C. arcuata* variety *crataegi*. Then, in 1916, Osborn and Drake raised Morrill's variety to specific rank. *Crataegi* must now go into synonymy, as it has recently come to light that Dr. Asa Fitch described and figured this species under the name *T. cydoniae* in the Country Gentleman, February 14, 1861. Osborn and Drake erroneously quote the International Code in saying that *cydoniae* is invalid because it was described and published in a non-scientific journal.

This species ranges over the entire United States and is also reported from southern Canada. Hawthorn and quince are its native food plants; however, it has been occasionally reported from other trees but in no great numbers.

22. *Corythucha padi* Drake

1917. *Corythucha padi* Drake, Ohio Journal Sci., xxvii, no. 6, p. 215.

Hood twice as high as median carina, with height about two-thirds its length, noticeably longer than median carina. Height of hood not greater than length of median carina. Reticulations of hood large. Spines on membranous margins and nervures rather small, not numerous. Costal margins of elytra nearly straight. Size, 4 mm. long, 2.4 mm. wide.

Brown spot on paranota. Top of hood more or less embrowned. Brown band across base and apex of elytra. Apical band with a few areoles partially hyaline. Apical areoles sometimes appear entirely hyaline.

Species is recorded from Montana, Oregon, Washington, and British Columbia. The host plant is Western Choke Cherry (*Prunus demissa*). The type and eighteen paratypes have been examined.

23. *Corythucha fuscomaculata* Stål

1858. *Tingis fuscomaculata* Stål, Rio Hem., i, p. 63.

1873. *Corythucha fuscomaculata* Stål, Enum., iii, p. 123.

Pronotal hood slightly higher than median carina, and noticeably longer; its height equals more than one-half its own length. Median carina well arched, almost as much as in *gossypii* Fabr. Lateral carinae small. Reticulations of hood very large. Costal margins of elytra nearly straight. Spines on membranous margins and nervures rather long and numerous. Length 3.6 mm., width 2.2 mm.

Nervures of hood embrowned. Two distinct brown spots on paranota. Brown band across base of elytra and another across elytra just behind the large apical cells, which are entirely hyaline. Two or three cells in apical band entirely hyaline.

Two specimens from Brazil in the National Museum collection have been examined. Food plant unknown.

24. *Corythucha coloradensis* new species

Pronotal hood higher than but not twice as high as median carina; one-half to two-thirds as high as its own length. Length of hood noticeably longer than median carina. Median carina arched, with but one row of large areoles. Reticulations of hood large. Spines on membranous margins rather small, scarce on nervures. Size, 3.8 mm. long, 2 mm. wide.

Crest of hood more or less embrowned. Light brown spot on paranota. Brown band across base and apex of elytra. Apical band about one-fourth the length of elytra and directed forwards along inner border. Areoles in apical band only partially hyaline, none entirely so.

Type.—♀, Platte Canyon, Colorado. (Dyar and Caudell, May 20, 1901.) (Collection of United States National Museum.)
Allotype.—♂, same data as type. *Paratype*.—♂, same data as type.

The above mentioned specimens were taken from poison oak. A single specimen is at hand from Wawawai, Washington, and one from Bad Lands, Sioux County, Nebraska, in the Barber collection, has been examined.

25. *Corythucha elegans* Drake, new species

Pronotal hood at least twice as high as median carina and considerably larger. Height of hood more than half its own length and distinctly greater than length of median carina. Crest of hood more or less angulate. Median carina well arched. Lateral carina normal, with areoles. Reticulations of hood about twice the size of those of paranota. Costal margins of elytra nearly straight. Spines on membranous margins small and numerous, numerous on nervures of hood. Size, 3.5 mm. long, 2 mm. wide.

Nervures of hood and paranota embrowned, with areoles more or less clouded with cream. A light brown band across base and apex of elytra. Tumid elevations embrowned. Areoles in apical band more or less opaque, none entirely hyaline.

Type.—♀, Poudre Canyon, Colorado. (Collection of C. J. Drake.) *Allotype*.—♂, same data as type. *Paratype*.—♀, same data as type.

During the summer of 1917, Mr. Drake found what seems to be this species occurring quite commonly on willow at Cranberry Lake, New York.

26. ***Corythucha molliculata*** Osborn and Drake

1916. *Corythucha molliculata* Osborn and Drake, Ohio Jr. Sci., xvii, no. 1, p. 12.

This species was described from a single specimen bearing the locality label—Ag. Coll. Mich. June 12, 1890. Because of the general inadvisability of describing a new species from a single specimen without a known food plant, and because of the broken and missing median carina, a redescription is hardly warranted. Until a large series is procured the author must keep the validity of this species under suspicion. However, the triangular shape of the hood, with but little constriction, may prove sufficient to keep it distinct. Other characters are to be noted from the key.

27. ***Corythucha salicata*** new species

Pronotal hood slightly higher than median carina. Height of hood about one-half its own length, and length slightly shorter than median carina. Median carina of normal height, not arched. Lateral carinae long, terminating a short distance from base of hood. Reticulations of hood about same size as those of paranota. Spines on membranous margins and nervures small and scarce. Costal margins of elytra nearly straight, slightly constricted at the middle. Size, 3.4 mm. long, 2 mm. wide.

General aspect above white or cream colored. Crest of hood slightly embrowned. Two faint brown spots on paranota. Rather faint brown band across base, which is sometimes obsolete, and apex of elytra with tumid elevations embrowned and rather pointed or acute. A tiny brown spot at center of costal margin of elytra.

This species is very similar to *drakei* new species, but from which it may be separated by the less arched median carina, which is slightly shorter, and by the angulate tumid elevations of elytra.

Type.—♀, Hood River, Oregon. (J. C. Bridwell, Aug. 4, 1908.) (Collection of C. J. Drake.) *Allotype*.—♂, same data

as type. *Paratypes*.—One female and six males, same data as type.

28. ***Corythucha occidentalis*** Drake, new species

Hood highly elevated, slightly longer than high, moderately constricted at the middle, the posterior portion narrowed dorsally. Pronotum with the lateral margins rather broad, reniform, armed with spines on the outer margins; median carina moderately elevated, about one-fourth as high as the hood, composed of either a single series of large areoles or with a few cells divided near the middle and forming a double series; lateral carinae widely separated from the hood, raised anteriorly, with three or four distinct cells. Elytra with large tumid elevation, the outer margin very strongly concave and beset with spines; costal area mostly triseriate, usually a few extra cells near the base. Antennae clothed with a few long hairs, the first segment three times the length of the second. Claspers strongly curved in the male. Length 2.75 mm., width 1.52 mm.

General color brown. Pronotum, a large spot on the paranota, a small spot on the median carina, brown. Hood embrowned. Elytra with a broad band at the base, another near the apex, more or less of the inner margin, and the tumid elevations, brown. Body beneath reddish-brown, in one specimen partially blackened. Eyes black.

Type.—♀, Siskiyou County, California. (Collection of C. J. Drake.) *Paratypes*.—One in Drake collection, one in collection of California Academy of Sciences.

29. ***Corythucha pergandei*** Heidemann

1906. *Corythucha pergandei* Heidemann, Proc. Ent. Soc. Wash., viii, nos. 1 and 2, p. 10.

Pronotal hood higher than median carina, but not twice as high. Its height equals at least one-half its own length. Length of hood about equal to that of median carina. Reticulations of hood large. Lateral carinae rather large, but short. Costal margins of elytra straight. Spines on membranous margins rather short and inconspicuous. Size, never more than 3 mm. long, often slightly less, 1.7 mm. wide.

Nervures of hood and anterior portion of paranota more or less embrowned. A light brown band across base and apex of elytra. Apical band with no areoles entirely hyaline.

The type specimens, which were collected at Washington, District of Columbia, together with many others have been examined. The range of distribution is from the New England States, west to Wisconsin and south to Kansas, California and Texas.

The known food plants include Hazel, Elm, Crab-apple, Black Alder and Sweet Birch.

30. *Corythucha coryli* Osborn and Drake

1917. *Corythucha coryli* Osborn and Drake, Ohio Jr. Sci., xvii, no. 8, p. 299.

Hood at least twice as high as the median carina, and distinctly longer. Height of hood nearly two-thirds its own length. Median carina arched. Reticulations of hood very large. Spines on membranous margins quite long, scarce on nervures. Costal margins of elytra distinctly concave. Small species, 2.8 mm. long, 1.52 mm. wide.

Hood embrowned. Brown band across base and apex of elytra. Apical band with no large hyaline areoles.

This species is noticeably smaller than *incurvata* Uhler, from which it may also be distinguished by the distinct dark apical band on elytra.

The type and two paratypes in the Drake collection have been examined. They were collected on Hazelnut (*Corylus americana*), by Mr. W. L. McAtee, at Plummer's Island, Maryland, 1914.

This species was known to Mr. Heidemann under his manuscript name *bulata*.

31. *Corythucha borealis* Parshley, new species

Pronotal hood at least twice as high as median carina and noticeably longer. Height of hood at least one-half its own length and not noticeably greater than length of median carina. Lateral carinae very low and short. Reticulations of hood larger than those of paranota. Spines normal in size and number. Costal margins of elytra straight. Size, 2.8 mm. long, 2 mm. wide.

Hood more or less embrowned. A light brown spot on paranota. Light brown band across base and apex of elytra. Apical band without any entirely hyaline areoles. Tumid elevations and inner borders of elytra light brown.

Type.—♀, Orono, Maine. (Collection of H. M. Parshley.)

Allotype.—♂, same data as type. *Paratypes*.—Two females, same data as type.

Food plant unknown.

32. *Corythucha incurvata* Uhler

1894. *Corythucha incurvata* Uhler, Proc. Cal. Acad. Sci., iv, p. 280.

Pronotal hood very large, twice as high as median carina, and its height equal to two-thirds the length of the hood. Length of hood considerably greater than length of median carina. Hood abruptly constricted at the middle, globose portion wider than long, not flattened on top or posteriorly. Reticulations of hood large. Median carina arched before. Lateral carinae of medium height, short, terminating a considerable distance from base of hood. Costal margins of elytra distinctly concave. Spines on membranous borders short. Length 3.3 mm., width 2.9 mm.

General aspect above yellowish brown. Membranous portions hyaline with nervures yellow. Crest of hood more or less embrowned. Pronotum proper, brown. Inner border of elytra more or less embrowned. Faint brown band across apex of elytra, tumid elevations more or less brown and a slight brown spot in each anterior-lateral angle of elytra.

The type in the United States National Museum and many other specimens have been studied. This is a western species, occurring in California and Arizona.

Heteromelei, a manuscript name of Heidemann, refers to this species. *Heteromeles arbutifolia* is the food plant. An excellent treatise on its life history and description of nymphs was published by M. C. Pemberton.²

33. *Corythucha brunnea* new species

Pronotal hood fully twice as high as median carina, its height more than one-half its own length. Top of hood from crest forward slightly concave. Crest very angulate. Median carina distinctly shorter than hood, of medium height. Lateral carinae normal. Reticulations of hood larger than those of paranota. Spines on membranous margins rather short and not at all numerous. Costal margins of elytra nearly straight. Length 3 mm., width 1.8 mm.

General dorsal aspect dark. Nervures brown or yellowish. Hood almost entirely embrowned. Paranota with two dark spots. A wide basal and apical dark brown band across elytra. Apical band fully one-third the length of elytra, and with three large areoles more or less hyaline and others hyaline at their centers.

Type.—♀, Alexandria, Louisiana. (Collection of United States National Museum.) *Allotype*.—♂, same data as type. *Paratypes*.—Six female and seven males, same data as type.

The above mentioned specimens were taken from *Crataegus* species. Other specimens from Logansport, Shreveport and Monroe, Louisiana, and Liberty, San Antonio and Dallas, Texas, have been examined.

34. *Corythucha bellula* new species

Pronotal hood more than twice as high as median carina, its height is more than one-half its own length. Crest of hood distinctly angled. Areoles of hood large. Median carina low, not arched, shorter than length of hood. Lateral carinae normal. Spines on membranous margins normal. Costal margins of elytra straight. Size, 3 mm. long, 1.9 mm. wide.

Color; nervures of hood embrowned; paranota with a distinct brown spot, sometimes a less distinct second spot. Elytra with basal and apical band.

²Journ. Econ. Ent., Vol. 4, No. 3, p. 339, 1911.

Apical band slightly more than one-fourth wider than length of elytra. Two or three partially hyaline areoles in apical band. Apical areoles hyaline, differing in this respect from the preceding species.

Type.—♀, Tiffin, Ohio. (Col. by C. J. Drake.) (Collection of United States National Museum.) *Allotype*.—♂, same data as type. *Paratypes*.—Nine females, same data as type.

The above mentioned specimens were captured on *Crataegus* species.

35 *Corythucha lactea* Drake, new species

Hood very highly elevated, very abruptly constricted at the middle, the length a little greater than the height. Sides of hood, dorsal surface of the paranota and elytra, outer margins of paranota and elytra, except distal third, armed with rather stout spines. Paranota not very large, reniform. Pronotum with the posterior process small, areolate; median carina highly elevated, a little more than one-third of the height of the hood; lateral carinae widely separated from the hood, strongly raised anteriorly, with two or three distinct areoles. Elytra rather strongly concave on the outer margin, the costal area triseriate. Claspers strongly curved in the male. Length, male 3.15 mm., female 3.85 mm.; width, male 2 mm., female 2.4 mm.

General color lacteous. Hood, pronotum, paranota, carinae and elytra lacteous, a few veinlets sometimes very faintly margined with light brown, and when so the color markings resemble those of *morrilli* Osborn and Drake. Legs and antennae testaceous. Body beneath brownish, sometimes slightly darkened. Eyes black.

Type.—♀, Stansbury Island, Great Salt Lake, Utah. (Collection of C. J. Drake.) *Paratypes*. From same locality in collections of Prof. Larson and California Academy of Sciences.

36. *Corythucha marmorata* Uhler

1878. *Corythucha marmorata* Uhler, Proc. Bost. Soc. Nat. Hist., xix, p. 415.

Pronotal hood considerably higher than median carina but not twice as high. Height of hood about two-thirds its length and equal to the length of the median carina. Hood not flattened on top or posteriorly and not prominently constricted at the middle. Length of globose portion greater than its width. Reticulations of hood slightly larger than those of paranota. Median carina arched. Lateral carinae very small, low, short, terminating a considerable distance from base of hood, and without areoles. Costal borders of elytra straight. Width of elytra at apex very nearly equals the width at anterior line of elytra. Spines on membranous margins and on nervures short. Length 3.2 mm., width 1.8 mm.

Antennae and legs yellowish, hood and paranota lacteous; the nervures more or less embrowned with usually a brown spot in center. Elytra lacteous, with the centers of areoles hyaline, with four irregular, transverse, smoky brown bands.

Its range includes the entire United States. Mr. McAtee reports the food plants of this species in the vicinity of Washington, D. C., as being various members of the genus *Aster*. It has been reported as injurious to *Chrysanthemums*.

Riley's manuscript name *irroratus* refers to this species.

37. ***Corythucha mexicana*** new species

Pronotal hood high, but slightly less than twice as high as median carina, its height more than one-half its length. Length of hood noticeably greater than length of median carina. Lateral carinae terminating close to base of hood. Reticulations of hood somewhat larger than those of paranota. Spines rather fine, short, but placed close together on membranous margins. Costal margins of elytra rather concave. Size, 2.8 mm. long, 1.7 mm. wide.

Membranous portions hyaline, marked with brown. Nervures of hood and paranota more or less embrowned. Nervures of elytra embrowned in the form of a band across base and a wide one across apex. Many areoles in apical band hyaline. Nervures at center of costal margin of elytra embrowned to form a spot.

Type.—♀, Linares, Nuevo Leon, Mexico. (Collection of J. R. Bueno.) *Allotype*.—♂, same data as type. *Paratypes*.—Three females and five males, same data as type.

Three other specimens in Mr. Bueno's collection from San José, Tamaulipas, Mexico, have been examined. Food plant unknown.

38. ***Corythucha morrilli*** Osborn and Drake

1917. *Corythucha morrilli* Osborn and Drake, Ohio Jr. Sci., xvii, no. 8, p. 298.

Pronotal hood more than twice as high as the median carina and its height at least two-thirds its own length. Length of hood considerably greater than length of median carina. Globose portion of hood longer than broad. Hood gradually narrowed anteriorly but not prominently constricted, nor at all flattened on top or posteriorly. Reticulations of hood not large. Median carina with two rows of areoles. Lateral carinae long, rounding, terminating close to base of hood, and with areoles. Costal margins of elytra concave. Spines along costal border of elytra and paranota, and on nervures medium length, rather numerous but not prominent. Length, 3 mm., width, 1.5 mm.

Hood more or less embrowned, paranota hyaline and tinged with fuscous, becoming a dark spot at middle, which in some specimens is faint or entirely missing. Elytra hyaline crossed with four irregular brown bands. These bands in some specimens are very faint and more nearly approach spots. A few specimens examined have only faint traces of any brown markings and may be considered a pale color form.

The type and seven paratypes as well as innumerable other specimens have been studied. *Morrilli* was a manuscript name

of Heidemann's. It occurs throughout the southwest portion of the United States and Mexico, where it is one of the commonest species of the genus. It is to be found on various cultivated plants and weeds.

39. *Corythucha decens* Stål

1835. *Tingis gossypii* Burmeister (not of Fabricius), Handb. der Ent., ii, p. 259.

1862. *Tingis decens* Stål, Stett. Ent. Zeit., p. 324.

Hood at least twice as high as median carina, which is extremely short, being not more than one-quarter of the length of hood. Hood constricted before the middle, apex quite acute, globose portion large. Height of hood fully one-half the length of hood. Reticulations of hood much larger than those of paranota. Lateral carinae minute, nearly obsolete. Costal margins of elytra more or less concave. Spines on membranous margins and nervures numerous. Size, 3 mm. long, 1.7 mm. wide.

General color aspect yellow. Nervures of hood more or less embrowned. Small brown spot on paranota. Brown band across base of elytra and another across apex. Basal band sometimes confined to anterior-lateral angle of elytra. Apical band wide, about one-third the length of elytra, not closed anteriorly, with large hyaline areoles. A brown spot at center of costal margin of elytra.

The only specimens which I have seen are from Paraiso, Panama Canal Zone, and were collected by Mr. E. A. Schwarz in 1911. Champion, in the *Biologia Centrali-Americana*, lists its occurrence in North America, Mexico, Central America and West Indies. Food plant unknown.

This species can readily be separated from all others by the extremely short median carina and nearly obsolete lateral carinae. These points are well illustrated in the *Biologia Centrali-Americana*.

40. *Corythucha gossypii* Fabricius

1794. *Acanthia gossypii* Fabricius, Ent. Syst., iv, p. 78.

1803. *Tingis gossypii* Fabricius, Syst. Rhyng., p. 126.

1868. *Galeatus gossypii* Stål, Hem. Fabr., i, p. 93.

1873. *Corythucha gossypii* Stål, Enum., iii, p. 123.

Pronotal hood as high as or slightly lower than median carina, its height equal to one-half its length. Length of hood considerably less than length of median carina. Hood constricted at the middle but not prominently so, and not noticeably on top or posteriorly. Globose portion of the hood wider than long. Reticulations of hood small. Median carina arched with at least two rows of areoles. Lateral carinae small, terminating a considerable distance

from base of hood, and without distinct areoles. Costal margins of elytra nearly straight. Spines on membranous margins medium length to long. Nervures of hood with numerous spines, and a few scattered ones on nervures of elytra. Length 3 mm., width 1.6 mm.

All membranous portions hyaline, nervures white except those which are embrowned. Antennae and legs yellow. Anterior portion and crest of hood more or less embrowned. A brown spot at middle of the outer border of paranota. A distinct brown spot on each tumid elevation of elytra. Two faint brown streaks from the costal margin of elytra on the anterior half. Two faint brown bands across apical half of elytra, appearing sometimes as mere spots.

Occurs throughout southern United States, Central America and West Indies. Common on cotton and has been captured on *Icthyonethia piscipula*. Numerous specimens have been examined.

41. *Corythucha unifasciata* Champion

1901. *Corythucha unifasciata* Champion, Biol. Cent.-Amer., Hemip., ii, p. 7.

Pronotal hood somewhat higher than median carina, but not twice as high. Height of hood slightly more than one-half its length. Length of hood less than length of median carina. Hood not flattened on top or posteriorly, constricted at the middle. Width of globose portion slightly greater than its length, reticulations large. Median carina with one row of areoles and posterior half low. Lateral carinae of median size with areoles and short spines, and terminating a considerable distance from base of hood. Costal margins of elytra straight. Spines on membranous borders long and stout. Numerous smaller spines on nervures of membranous portions, especially on hood. Length 3.3 mm., width 2 mm.

General dorsal aspect yellowish brown. Membranous areoles hyaline, nervures yellow. Antennae and legs yellow. Crest of the hood more or less embrowned. Two brown spots on paranota. Brown band at base of elytra and a more or less indistinct irregular brown band near apex of elytra.

A few specimens from southern United States, Mexico and Central America have been examined. Food plant unknown.

42. *Corythucha ulmi* Osborn and Drake

1916. *Corythucha pallida* var. *ulmi* Osborn and Drake, Ohio Biol. Surv., ii, no. 4, p. 231.

Hood higher than median carina, but not twice as high, about equal in length to median carina. Height of hood equals one-half its own length. Lateral carinae rather high but short. Reticulations of hood more than twice the size of those of paranota. Spines on membranous margins and on nervures of hood normal length and size. Costal margins of elytra straight. Size, 3.3 mm. long, 1.6 mm. wide.

Nervures all yellow to light brown. Nearly obsolete brown spots on paranota. Brown band across base of elytra, but with no distinct band across apical portion of elytra, nervures may be embrowned but areoles not clouded.

Type and paratypes in the Drake collection examined. They were collected on *Ulmus americana* at Plummer's Island, Maryland, by Mr. W. L. McAtee. Other specimens from New York and South Carolina were examined. Osborn and Drake also report its capture at Lisbon, Ohio. Although resembling *pallida* Osborn and Drake in general color markings, it may be distinguished from *pallida* by the smaller size and having a brown band across base of elytra. Since Osborn and Drake first published a note on *pallida* var. *ulmi*, they also have come to the conclusion that it should be raised to specific rank.

43. **Corythucha mali** new species

Resembling *ulmi* Osborn and Drake. Pronotal hood only slightly higher than median carina and about equal to it in length. Height of hood one-half its own length. Reticulations of hood large, abruptly constricted at the middle. Median carina well arched. Lateral carinae of normal height, with two or three areoles. Lateral margins of elytra nearly straight. Elevations of elytra large. Spines on membranous margins normal. Size, 3.7 mm. long, 2.3 mm. wide.

Nervures of hood somewhat embrowned, not dark. Paranota with a faint brown spot. Elytra with a distinct basal band, but without a distinct apical one, although the nervures in apical portion may be slightly embrowned and one or two areoles slightly clouded.

Type.—♀, Lakehurst, New Jersey. (Collection of H. G. Barber.) *Allotype*.—♂ same data as type. *Paratypes*.—Two females and one male, same data as type.

44. **Corythucha drakei** new species

Pronotal hood slightly higher than median carina and slightly shorter. Height of hood equals one-half its own length. Median carina of normal height. Lateral carina long, terminating a short distance from base of hood. Reticulations of hood about same size as those of paranota. Spines on membranous margins and nervures small and scarce. Costal margins of elytra nearly straight. Tumid elevations of elytra well rounded and rather long. Size, 3.6 mm. long, 1.9 mm. wide.

General aspect above light brown. Nervures more or less yellowish to light brown. Only a faint basal band across elytra. Apical band more distinct. Tumid elevations more or less embrowned.

Type.—♀, Portland, Oregon. (Collection of C. J. Drake.)

Allotype.—♂, same data as type. *Paratypes*.—Two females and four males, same data as type.

The above mentioned specimens were captured from apple trees. Two other specimens from San Diego, California, with E. P. VanDuzee collector label attached, and four specimens from La Fayette, Oregon, have been examined.

Named in honor of Mr. Carl J. Drake, who has manifested a considerable interest in this genus.

45. *Corythucha spinosa* Dugès

1889. *Tingis spinosa* Dugès, La Nat., (2), i, p. 207.

1901. *Corythucha spinosa* Champion, Biol. Cent.-Amer., ii, p. 8.

Pronotal hood slightly higher than median carina, but its height is less than one-half the length of the hood. Hood extremely low and flattened posteriorly from the crest, constricted at the middle, globose portion appearing slightly wider than long. Reticulations of hood and paranota of same size. Median carina longer than length of hood, very low, as low or lower than lateral carinae. Lateral carinae of medium height, rounding and terminating a considerable distance from base of hood. Costal margins of elytra slightly indented at the middle. Spines on borders of membranous portions long and stout. Spines on nervures shorter, numerous on anterior portion of hood. Length 3.8 mm., width 2.3 mm.

General aspect yellow. Nervures yellow, slight brown markings on hood behind crest, two slight brown spots on paranota, irregular faint brown band across elytra near base and another near apex. Center of costal margin of elytra with small brown spot.

Food plant unknown. Has been recorded from Mexico and Central America.

46. *Corythucha eriodictyonae* Osborn and Drake

1917. *Corythucha eriodictyonae* Osborn and Drake, Ohio Jr. Sci., no. 8, p. 302.

Pronotal hood slightly higher than median carina. Length of hood shorter than median carina and height of hood about equal or, if any, slightly less than one-half its own length. Median carina long and low, with but one row of areoles. Lateral carinae high but short. Reticulations of hood the same size as those of paranota. Costal margins of elytra straight. Spines on membranous margins and nervures long, numerous and stout. Hood abruptly constricted. Size, 3.7 mm. long, 2.2 mm. wide.

General color above yellow or light brown. Nervures all yellow, a few at base and near apex of elytra distinctly embrowned. No areoles clouded. General color much resembles that of *pallida* Osborn and Drake. This species very closely resembles *spinosa* Dugès, and with a larger series at hand may prove to be a synonym of that species. The specimens examined are slightly

smaller in general size, with the spines shorter and not quite so numerous on nervures of elytra. Also the globose portion of the hood is smaller and narrower.

The type, seven paratypes, and twenty other specimens in the Drake collection have been examined, as well as many others in the U. S. National Museum and other collections. The food plant of the species is *Eriodictyon californicum*. This species has been noted to occur only in California.

47. **Corythucha pallida** Osborn and Drake

1916. *Corythucha pallida* Osborn and Drake, Ohio Biol. Surv., ii, no. 4, p. 231.

Pronotal hood somewhat higher than median carina, its height equal to one-half its length, and about as long as median carina. Hood not at all flattened, constricted at about the middle with globose portion wider than long, and with very large areoles. Median carina arched, with at least two very large areoles. Lateral carina medium sized and terminating a considerable distance from the base of the hood. Costal borders of elytra straight. Areoles in elytra large, especially so near the apex. Spines prominent, tipped with black, numerous but not especially long. Length 3.8 mm., width 2.2 mm.

Dorsal aspect yellowish, membranous portions hyaline with nervures distinctly yellow. Only color markings are two faint brown bands, one near the anterior line of elytra and the other near the apex of elytra, sometimes lacking. Antennae yellow.

A paratype and innumerable specimens have been studied. Linden (*Tilia americana*) and mulberry (*Morus rubra*) are the known food plants of this species. It ranges from Maryland and Virginia west through Ohio, and southwestward through Tennessee to Arizona. Uhler's manuscript name *adusta* refers to *pallida*.

48. **Corythucha setosa** Champion

1901. *Corythucha setosa* Champion, Biol. Cent.-Amer., Hemip., ii, p. 7.

Pronotal hood low, flat, and appearing long and narrow from above; only slightly higher than median carina which itself is very low, as low or lower than the lateral carinae. Height of hood less than one-half its length. Length of hood noticeably less than length of median carina. Hood is narrowed anteriorly but not constricted. Reticulations of hood small, same size as reticulations of paranota. Lateral carinae about same height as median carina, with areoles, and terminating a considerable distance from base of hood. Costal border of elytra straight. Spines on membranous portions numerous, short and tipped with black. Length 3.5 mm., width 2.2 mm.

General aspect above yellow. Membranous portions hyaline. Nervures all yellow. Pronotum yellow to fuscous. Fuscous spot on each tumid elevation of elytra and one in each anterior-lateral angle of elytra.

A few specimens from Central America have been examined. Its occurrence seems to be restricted to Mexico and Central America. Food plant unknown.

48. **Corythucha floridana** Heidemann

1909. *Corythucha floridana* Heidemann, Bull. Buffalo Soc. Nat. Sci., ix, p. 236.

This species is easily recognized by its minute size, being the smallest species in the genus. Pronotal hood only slightly higher than median carina. Height of hood about one-half its own length. Median carina slightly shorter than hood. Reticulations of hood large. Spines on membranous margins normal, not abundant. Costal margins of elytra straight. Size, 2.4 mm. long, 1.2 mm. wide.

Nervures of hood slightly embrowned. Paranota with one faint brown spot. A light brown band across base of elytra and a mere trace of one across apex. Nervures only in apical band embrowned, areoles hyaline.

Type and allotype, from Bartow and Biscayne Bay, Florida, and several other specimens from Florida examined. Mr. Heidemann reported the species as being taken on *Cephalanthus*. It is also known to occur on oak.

50. **Corythucha caelata** Uhler

1894. *Corythucha caelata* Uhler, Proc. Calif. Acad. Sci., iv, p. 279.

Pronotal hood only slightly higher than median carina. Height of hood less than half its length. Length of hood less than length of median carina. Hood constricted at the middle. Globose portion spherical, anterior portion long and narrow. Reticulations of hood small, same size as those of paranota. Lateral carinae as high as or higher than median carina, with areoles, and terminating a considerable distance from base of hood. Costal margins of elytra slightly concave. Outer spines along costal borders of elytra and borders of paranota and on anterior portion of hood long tipped with black. Length 3.5 mm., width 1.9 mm.

Above whitish or cream. Membranous portions hyaline, nervures white. Faint brown spot behind each tumid elevation of elytra and one in each anterior-lateral angle of elytra. Nervures near apex of elytra slightly and irregularly tinged with brown.

Occurs in the Pacific Coast States and Mexico. Has been recorded upon apple. Type and many specimens have been examined.

51. **Corythucha arcuata** Say

1832. *Tingis arcuata* Say, Hem. New Harm., p. 27.

1903. *Corythucha arcuata* Morrill, Psyche, x, pp. 127 to 132.

Pronotal hood only slightly higher than median carina; height slightly less, if any, then one-half its length. Length of hood and median carina about

equal. Hood flattened somewhat on top. Globose portion of hood slightly wider than long. Hood prominently constricted. Reticulations of hood large, larger than those of paranota. Median carina arched, with at least one large areole next to base of hood, usually with two rows. Lateral carina short and terminating a considerable distance from base of hood, with areoles clouded. Elytra about as wide at apex as at anterior line of elytra, costal borders straight. Spines along costal border of elytra, border of paranota and at apex of hood small, not numerous. Length 3.1 mm., width 1.6 mm.

General dorsal aspect varies from whitish to yellowish and fuscous. Nervures usually yellowish. Antennae and legs yellowish. Hood more or less embrowned. Paranota sometimes unmarked, usually with a brown spot placed anteriorly, sometimes a faint brown spot posteriorly. Brown band at base of elytra and an irregular brown band across apex of elytra sometimes entirely obsolete.

This species has had the manuscript names of *T. querci* of Riley and *betulae* of Heidemann.

It occurs over the entire United States east of the Rocky Mountains. Oak is its native food plant. Innumerable specimens have been studied.

52. *Corythucha ciliata* Say

1832. *Tingis ciliata* Say, Hem. New Harm., p. 27.

1903. *Corythucha ciliata* Morrill, Psyche, x, p. 133.

Pronotal hood only slightly higher than median carina, flattened on top and posteriorly. Height of hood less than one-half its length. Length of hood and median carina about equal, median carina sometimes appears slightly longer. Hood not prominently constricted, reticulations even and not large, about same size as those of paranota. Median carina with two rows of areoles. Lateral carinae large and high, with areoles, but terminating a considerable distance from base of hood. Costal margins of elytra nearly straight. Spines on borders of paranota and elytra and on nervures of hood small. Length 3.75 mm., width 1.6 mm.

Dorsal aspect whitish or hyaline, only brown markings being a spot on each tumid elevation of elytra.

This has long been known as the Sycamore Tingid and is known to occur on it wherever sycamore grows, east of the Rocky Mountains.

53. *Corythucha confraterna* new species

Pronotal hood slightly higher than median carina. Height of hood less than one-half its own length, length shorter than median carina. Median carina long with two rows of areoles. Lateral carinae high and rather long. Reticulations of hood distinctly larger than those of paranota. Spines on

membranous margins and nervures rather long. Costal margin of elytra nearly straight. Size, 3 mm. long, 1.7 mm. wide.

General color above white. Crest and median carina of hood embrowned. Tumid elevations of elytra embrowned posteriorly and nervures on apical portion of elytra more or less yellow or embrowned.

Type.—♀, Los Angeles, California. (Collection of United States National Museum.) *Allotype*.—♂, Chico, California. (Collection of United States National Museum.) *Paratypes*.—Two females, one from Chico and one from Santa Barbara, California, also in collection of United States National Museum.

Many other specimens from California and Mexico have been examined. This has previously been determined as a western form of *ciliata* Say, but the author considers it a distinct species separable from *ciliata* by distinct color markings and smaller size. Sycamore is the food plant of this species.

54. ***Corythucha immaculata*** Osborn and Drake

1916. *Corythucha immaculata* Osborn and Drake, Ohio Journal Sci., xxvii, no. 1, p. 11.

Hood somewhat higher than median carina, but not twice as high, height equals more than one-half its length. Length of hood shorter than median carina. Median carina well arched with two rows of areoles. Lateral carinae large and long, terminating near to base of hood. Costal margins of elytra straight. Tumid elevations of elytra well rounded. Reticulations of hood only slightly larger than those of paranota. Spines on membranous margins and nervures normal in size and number. Size, 4.1 mm. long, 2.5 mm. wide.

General aspect above pure white, immaculate. Sometimes appearing cream yellowish, especially with old specimens. No brown markings.

A paratype from Alameda, California, in the Drake collection, has been examined, and also several other specimens from Washington, Oregon and Montana. Greatly resembles *pura* Gibson, but may be distinguished from it by the larger reticulations of the hood, spines shorter, and larger in general size.

Food plant unknown.

55. ***Corythucha pura*** Gibson

1917. *Corythucha pura* Gibson, Ent. News, xxviii, no. 6, p. 258.

Pronotal hood higher than median carina, but less than twice as high, its height nearly two-thirds the length of the head. Length of hood equals length of median carina. Hood constricted at middle, globose portion wider than long and more or less flattened posteriorly. Reticulations of hood small, about same size as those of paranota. Median carina with two distinct rows of areoles. Lateral carinae high, long, with areoles, and terminating close to

base of hood. Costal margins of elytra nearly straight. Spines along membranous portions and on nervures numerous and small. Length 3.8 mm., width 2.5 mm.

Above pure white, membranous portions hyaline, only colors showing are the black eyes and yellow antennae and legs.

Type and paratypes were at hand for study.

The species has been recorded only from Washington, possibly occurs throughout the northwest. *Balsamorhiza sagittata*, the prairie sunflower, is the only known food plant.

56. **Corythucha hispida** Uhler

1894. *Corythucha hispida* Uhler, Proc. Cal. Acad. Sci., ser. 2, iv, p. 279.

Pronotal hood slightly higher than median carina, its height one-half of its length, slightly flattened posteriorly. Globose portion of hood small, slightly wider than long. Hood abruptly constricted behind the middle. Reticulations of hood small, equal in size to those of paranota. Median carina slightly longer than pronotal hood with two rows of areoles. Lateral carinae large, terminating near base of hood, and with large areoles. Costal margins straight. Few hairs on antennae. Spines numerous and long, on borders of elytra and paranota; nervures of hood, carinae, elytra, and paranota. Length 3.2 mm., width 1.9 mm.

Dorsal aspect entirely whitish or cream, membranous portions hyaline. Antennae and legs yellow-fuscous.

Food plant unknown. Occurs throughout the south and southwest. Many specimens, including the type, were at hand for study.

57. **Corythucha contracta** Osborn and Drake

1916. *Corythucha contracta* Osborn and Drake, Ohio Biol. Surv., ii, no. 4, p. 230.

The single specimen from which this species was described was evidently injured or dwarfed at the time of the last nymphal molt, as it is noticeably distorted, especially the elytra; and since capture has been otherwise too badly damaged to allow of its being placed with other species. The specimen was collected at Jefferson, Ohio. Food plant unknown.

The author is simply appending this to the foregoing treatment of species, as he considers its recognition as a distinct species unwarranted, but because of damaged condition it cannot be placed as a synonym of any other species.